WHAT IS CLAIMED IS:

1. A waveguide, comprising:

a first portion extending along a waveguide axis comprising a first chalcogenide glass; and

a second portion extending along the waveguide axis comprising a second chalcogenide glass, wherein the second chalcogenide glass is different from the first chalcogenide glass.

2. The waveguide of claim 1, wherein the first chalcogenide glass has a different refractive index than the second chalcogenide glass.

3. The waveguide of claim 1, wherein the first chalcogenide glass comprises As and Se.

4. The waveguide of claim 3, wherein the first chalcogenide glass comprises As_2Se_3.

5. The waveguide of claim 3, wherein the first chalcogenide glass further comprises Pb, Sb, Bi, I, or Te.

6. The waveguide of claim 1 or 3, wherein the second chalcogenide glass comprises As and S.

7. The waveguide of claim 6, wherein the second chalcogenide glass comprises As_2S_3.

8. The waveguide of claim 1 or 3, wherein the second chalcogenide glass comprises P and S.

9. The waveguide of claim 8, wherein the second chalcogenide glass further comprises Ge or As.

10. The waveguide of claim 1, further comprising a hollow core.

11. The waveguide of claim 1, wherein the first chalcogenide glass has a refractive index of 2.7 or more.

12. The waveguide of claim 11, wherein the second chalcogenide glass has a refractive index of 2.7 or less.

13. The waveguide of claim 1, wherein the first chalcogenide glass has a T_g of about 180°C or more.

14. The waveguide of claim 13, wherein the second chalcogenide glass has a T_g of about 180°C or more.

15. The waveguide of claim 1, wherein the waveguide has a loss coefficient less than about 2 dB/m for electromagnetic energy having a wavelength of about 10.6 microns.

16. The waveguide of claim 1, wherein the first portion surrounds a core.

17. The waveguide of claim 16, wherein the second portion surrounds the core.

18. The waveguide of claim 16, wherein the second portion surrounds the first portion.

19. The waveguide of claim 16, wherein the core has a minimum cross-sectional dimension of at least about 10 λ, where λ is the wavelength of radiation guided by the waveguide.

20. The waveguide of claim 19, wherein the minimum cross-sectional dimension of the core is at least about 20 λ.

21. The waveguide of claim 16, wherein the core has a minimum cross-sectional dimension of at least about 50 microns.

22. The waveguide of claim 21, wherein the core has a minimum cross-sectional dimension of at least about 100 microns.

23. The waveguide of claim 22, wherein the core has a minimum cross-sectional dimension of at least about 200 microns.

24. The waveguide of claim 1, wherein the waveguide is a photonic crystal fiber.

25. The waveguide of claim 24, wherein the photonic crystal fiber comprises a confinement region and the first and second portions are part of the confinement region.

26. The waveguide of claim 24, wherein the photonic crystal fiber is a Bragg fiber.

27. A method comprising:

providing a waveguide comprising a first portion extending along a waveguide axis including a first chalcogenide glass and a second portion extending along the waveguide axis; and

guiding electromagnetic energy from a first location to a second location through the waveguide.

28. The method of claim 27, wherein the second portion includes a second chalcogenide glass different from the first chalcogenide glass.

29. The method of claim 27, wherein the electromagnetic energy has a wavelength of between about 2 microns and 15 microns.

30. The method of claim 29, wherein the electromagnetic energy has a power of more than about one Watt.

31. The method of claim 30, wherein the electromagnetic energy has a power of more than about 10 Watts.

32. The method of claim 31, wherein the electromagnetic energy has a power of more than about 100 Watts.

33. The method of claim 27, further comprising coupling the electromagnetic energy from a laser into the waveguide.

34. The method of claim 33, wherein the laser is a CO_2 laser.

35. The method of claim 27, wherein the waveguide is a photonic crystal fiber.

36. The method of claim 35, wherein the photonic crystal fiber is a Bragg fiber.

37. An apparatus, comprising

a dielectric waveguide extending along an axis and configured to guide electromagnetic radiation along the axis, wherein the electromagnetic radiation has a power greater than about 1 Watt.

38. The apparatus of claim 37, wherein the electromagnetic radiation has a wavelength greater than about 2 microns.

39. The apparatus of claim 38, wherein the electromagnetic radiation has a wavelength greater than about 5 microns.

40. The apparatus of claim 37, wherein the electromagnetic radiation has a wavelength less than about 20 microns.

41. The apparatus of claim 40, wherein the electromagnetic radiation has a wavelength less than about 15 microns.

42. The apparatus of claim 39, wherein the electromagnetic radiation has a wavelength from about 10 microns to 11 microns.

43. The apparatus of claim 42, wherein the electromagnetic radiation has a wavelength of about 10.6 microns.

44. The apparatus of claim 37, wherein electromagnetic radiation has a power greater than about 5 Watts.

45. The apparatus of claim 44, wherein electromagnetic radiation has a power greater than about 10 Watts.

46. The apparatus of claim 45, wherein electromagnetic radiation has a power greater than about 100 Watts.

47. The apparatus of claim 37, wherein the dielectric waveguide comprises a first portion extending along the waveguide axis comprising a first chalcogenide glass.

48. The apparatus of claim 47, wherein the dielectric waveguide further comprises a second portion extending along the waveguide axis, the second portion having a different composition than the first portion.

49. The apparatus of claim 48, wherein the second portion comprises a second glass different from the first chalcogenide glass.

50. The apparatus of claim 49, wherein the second glass is a chalcogenide glass.

51. The apparatus of claim 49, wherein the second glass is an oxide glass.

52. The apparatus of claim 37, wherein the waveguide is a photonic crystal fiber.

53. The apparatus of claim 52, wherein the photonic crystal fiber is a Bragg fiber.

54. The apparatus of claim 37, wherein the waveguide comprises a hollow core.